

Houston Business

A Perspective on the Houston Economy

Oil as Commodity: A Review of *The Genie Out of the Bottle*

M. A. Adelman, *The Genie Out of the Bottle: World Oil Since 1970*, Cambridge, Mass.: The MIT Press, 1995.

“**N**ow that oil is a commodity...” During the past decade in Houston, many sentences have begun with this phrase, often to explain how a declining oil market has changed our city’s businesses, power structure, banking, real estate and income. Morris Adelman is among the world’s most respected energy economists, and in no other city will you find quicker agreement with the thesis of his new book—oil is a commodity, has been a commodity throughout much of this century and will be a commodity for a long time to come. His book outlines the past and present implications of this thesis.

In *The Genie Out of the Bottle*, Adelman denies a special status to oil as a depleting resource or as an increasing-cost good to be conserved for future generations. He sets out to explain the turmoil of world oil markets in the 1970s and 1980s that resulted from OPEC’s gaining power over oil markets, power that the cartel used clumsily and with little foresight. He sees American energy and foreign policy often based on the mistaken notion that oil reserves were irreplaceable and would be exhausted before the 20th century was out. This book is an event-by-event economic history of the last 25 years in world oil markets. It proves the power of a market-based explanation of those times, shows how U.S. policy often betrayed our interests and points out what good policy might have been. As Adelman aptly concludes, the challenge to world oil was and is one of oil abundance.

This book is an event-by-event economic history of the last 25 years in world oil markets. It proves the power of a market-based explanation of those times, shows how U.S. policy often betrayed our interests and points out what good policy might have been. As Adelman aptly concludes, the challenge to world oil was and is one of oil abundance.

THE ECONOMICS OF PETROLEUM SUPPLY

For some, the controversial part of Adelman's book will be his assertion that it is not useful to think of oil and many other minerals as subject to depletion over time. We can be sure the doomsday environmentalist will bring different ideas to the table. And within the economics profession, there is a large academic literature that deals with the optimal strategy for consuming a fixed resource base over time. As we deplete a mineral base, its price presumably rises year by year because of increased scarcity. Thus, supply decisions are different for minerals, as we have to decide how much to hold in the ground today to take advantage of higher prices tomorrow. Adelman bluntly suggests economists find more useful pursuits. The earth's store of any mineral or hydrocarbon is neither knowable nor fixed in any useful sense, he claims, and advancing technology has only occasionally allowed the price of a mineral to rise for any extended period. Adelman builds a powerful case that for recent oil history and for many years into the future, the normal condition of a *competitive* oil market is one of rapid expansion of the reserve base under conditions of declining cost. If price did not fall after 1970, it is because of OPEC market power, not scarcity or a threat of running out of oil.

Adelman's view of the oil industry's supply problem is one of inventory renewal. The rule of thumb is that the industry should hold about 15 years' supply in the ground as proven reserves, that is, recoverable at today's prices and technology. The cost of reserves is strictly related to the investment needed to find them, to drill and complete the wells and connect to a pipeline or tanker terminal. As with every other industry, you will find the value of investment in oil by discounting future revenues over time.

Crude discovery in the United States peaked in 1930 with 13 billion barrels in reserve. Over the next 60 years, and outside Alaska, inventory turned over 10 times, and now 17 billion barrels are in reserve. The geology of the United States remained unchanged during these years, but technology kept making reserves available. Most of these reserves came from existing reservoirs, not new field discoveries. Adelman points out that the bread and butter of new oil supplies is learning to delineate and exploit known fields, and important technology has developed in this market. From 1966 to 1977, for example, the United States added 19 billion barrels of re-

serves, and 17 billion were from fields discovered before 1966. In contrast, Adelman sees new field discoveries for oil companies as analogous to R&D undertaken by manufacturers—risky, with highly uncertain results but with large rewards for luck and foresight.

Adelman searches in vain for signs of global oil scarcity. In 1970, as world oil prices hit their all-time low of \$1.21 per barrel (\$4.45 in today's dollars), Aramco paid an excise tax of 88 cents to producing governments and kept only 33 cents, but the company's return on investment was more than 100 percent per year. These kinds of high returns provided adequate incentives to invest further, and extensive plans were under way to expand OPEC reserves and producing capacity in 1970. Adelman finds the long-run marginal cost curves for oil available from noncommunist countries has shifted steadily to the right and flattened out since 1955, telling us that more oil was available each decade at a lower price.

THE GENIE UNBOTTLED

The "genie" of the book's title is the heady discovery by the producing governments of OPEC that they could control the price of oil. Adelman sketches the end of the old oil regime—the decline of the United States as an oil exporter, the end of Texas Gulf Plus as the world price of oil and the ascendancy of OPEC. The key lever for OPEC was the ability to set and manipulate a floor price for oil. The original concessions with producer governments were for profit sharing, and in 1948 Venezuela pushed this to a 50–50 split. Oil companies posted a price to determine revenue, subtracted production costs and then divided profit.

Any decrease in the posted price by the oil companies, which directly cut producing government revenues, came to be regarded by the governments as a unilateral and regrettable decision. By the 1960 formation of OPEC, the unspoken agreement became that the governments would set posted price—regardless of market price. The original tax on income became an excise tax per barrel, as market price could fall to zero and the per barrel tax continued. The world price of oil became "OPEC excise tax plus," in which the pluses entailed operating and transportation costs. Tentatively at first, then with confidence, OPEC found it could raise the tax and raise the floor under the price of oil. Prices might rise, but OPEC refused

to let them fall.

Using Economics 101 as a backdrop, Adelman lays out OPEC's problems as a cartel. Once in the saddle, its first problem was to set a monopoly price, and the working rule is to choose the closest substitute commodity and just undercut it. The cartel chose a figure far too high. Adelman documents that neither OPEC nor the consuming governments understood the long-run elasticity of the demand for oil. OPEC tried to set the price of oil just under the price of synthetic liquid fuels from coal, shale or tar sands, aiming at \$60 per barrel or above. It ignored the possibility of end-user conservation, which proved slow to develop but which became the primary challenge to the cartel by the end of the 1970s. OPEC also ignored oil-on-oil competition, failing to see the rapid and extensive development of non-OPEC resources in Mexico, the North Sea and Alaska. Combined with end-user conservation, non-OPEC producers taught the cartel the limits of its power. Today's \$18 oil prices still include substantial monopoly payments for OPEC, but at levels far more modest than the genie initially seemed to offer.

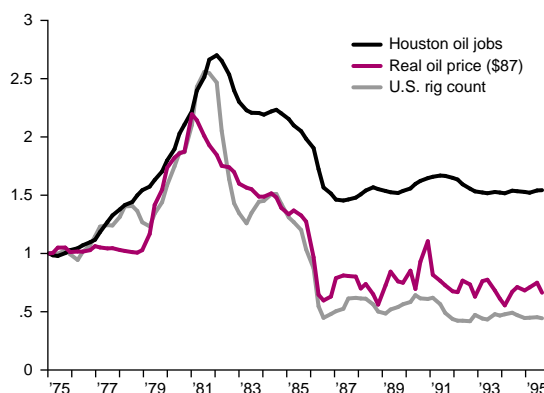
Second, and even harder, OPEC had to manage production cuts and decide who held excess capacity. In a competitive market, market price and comparative advantage solve this problem, as every producer operates to the point where marginal cost equals price. In a cartel, the producing governments collectively win by withholding production, but incentives are present—especially for the marginal producer—to cheat and produce too much. The burden of holding the line falls hard on the core of big producers, the producers that can't cheat without hurting themselves, and in OPEC that means Saudi Arabia. Adelman carefully documents how the allocation burden has shifted within OPEC, first informally and then through the quota system we see today.

RISE AND FALL

The rise and fall of OPEC and oil prices is a story well known to any Houston audience (*Figure 1*). Adelman's book, however, is special because it holds the events of the last 25 years up against an unforgiving standard of basic economics. As Nixon, Kissinger, Carter and Yamani moved on and off the world stage, what drove their view of oil? In retrospect, how could they have been so wrong? Indeed, how could

Figure 1
Boom and Bust in Oil Markets

Index: 1975 = 1.00 for all variables



SOURCE: Energy Information Administration.

we all have been so wrong? A number of economists (including Adelman) have taken credit for predicting the fall of oil prices in the 1980s, but Adelman can find only one *formal* study that correctly predicted the oil bust. The good news is that Houstonians and Texans were not alone in their delusion about oil prices—oil scarcity and unlimited price increases became the perceived wisdom of the 1970s. The bad news, perhaps, is that the only study Adelman cites (and which was widely ignored) was by three professors—George Daly, James Griffin and Henry Steele—all then at the University of Houston. If only we had paid attention.

However, if a villain exists for the expensive errors made in world oil for the last 25 years, Adelman chooses governments. *Producer* governments went too far too fast in their demands, often showing the short time horizon of unstable regimes. No matter how fast the money came in, they spent it faster for consumption, weapons and domestic subsidies. They proved terrible businesses, never able to follow a basic business plan. Meanwhile *consumer* governments felt trapped by looming oil scarcity. Price controls delayed the conservation response needed to combat high prices. American foreign policy sought "special" relationships with the Saudis, just as the French sought out the Algerians, in what Adelman claims was a mistaken assumption that cultivated goodwill could somehow bring down the price of oil. New supplies and shrinking oil demand ended the myth of oil scarcity, not diplomacy.

Houston energy companies were at the center of a scramble to deliver heating oil and natural gas to the Midwest and East Coast in December and January. A series of winter storms stressed energy distribution systems, which were further hindered by mechanical and labor problems at some refineries, storms in the North Sea and Gulf of Mexico and cold weather in Europe. Delivery generally proved reliable, but energy prices rose sharply and then seesawed widely as bad weather came and went.

RETAIL SALES AND AUTOS

The Houston shopper was the big winner over the holiday season, as stores kept long hours and offered tremendous markdowns. At a time the city is experiencing good job growth, the problem seems to be too many stores. None of the big chains met its plan for the holidays, and few matched 1994.

Meanwhile, November auto sales were up 16 percent from their year-ago level, resulting in a record November for Houston dealers. Year-to-date sales were up 6 percent over 1994.

OIL FIELD EQUIPMENT AND SERVICES

Demand for oil field equipment and products remains flat but at profitable levels, with good prices and no inventory problems. The year-end flurry of drilling activity that marked many past years failed to materialize in 1995. Respondents credited a combination of improved management techniques, better control of capital budgets and the absence of expiring tax credits to capture. Low levels of domestic drilling onshore continue to be offset by high levels of activity and rising day-rates for rigs in the Gulf of Mexico. International opportunities continue to grow, especially in Latin America.

PETROCHEMICALS AND REFINING

Commodity chemical markets continue to weaken, with production and consumption down in the fourth quarter compared with earlier in 1995. Prices and operating rates continue to fall. Despite the drop in operating rates, inventories remain under control. Products closer to the consumer—plastic and synthetic rub-

ber—are performing better, with stable prices and production turning up. Both gasoline and heating oil prices began to rise in mid-November. The refining industry entered the heating season with low crude inventories, partly to save costs after several warm winters and partly to avoid potential losses on inventory valuation after the November OPEC meeting. By mid-December, cold weather pulled crude inventories below 10 million barrels, or 6.4 percent below 1994's level. In mid-December, large oil product pipelines to the East Coast placed fuel oil and other customers on allocation.

Gasoline prices' November rise initially began with the shutdown of a large facility for blending winter fuels. They continued to rise as refinery capacity tightened due to potential labor problems and cold weather. The result was improving refinery margins through December, and refiners raised throughput to take advantage of these profits. The price of crude oil briefly moved over \$20 per barrel, following product prices upward.

NATURAL GAS PRICES

Natural gas is a local fuel, with its value often determined by its access to market by pipeline. Natural gas prices set records on the New York futures market in December and at the Henry Hub in Louisiana, where physical settlement for New York futures contracts takes place. Across the nation and the Eleventh District, however, gas prices varied widely, depending on pipeline access to the East Coast. While prices peaked at \$3.50 or more in Louisiana, prices at the Katy Hub near Houston were close to \$2 per thousand cubic feet. Prices in the Rocky Mountains were closer to \$1 to \$1.50.

HOUSTON REAL ESTATE

Despite good job growth, respondents continue to report that local real estate remains flat. The exceptions are quality warehouse space and single-family housing. New and used home sales continue to be strong, and 1996 may offer Houston home builders their first chance in 10 years to enjoy both favorable interest rates and local job growth.

For more information, call Bill Gilmer at (713) 652-1546.

For a copy of this publication, write to

Bill Gilmer • Houston Branch • Federal Reserve Bank of Dallas
P.O. Box 2578 • Houston, Texas 77252

The views expressed are those of the author and do not necessarily reflect the positions of the Federal Reserve Bank of Dallas or the Federal Reserve System.